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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/694,016	10/28/2003	Kimio Nakamura	HIRA.0127	3688
38327	7590	11/17/2004	EXAMINER	
REED SMITH LLP 3110 FAIRVIEW PARK DRIVE, SUITE 1400 FALLS CHURCH, VA 22042			MERCEDES, DISMERY E	
			ART UNIT	PAPER NUMBER
			2651	
DATE MAILED: 11/17/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/694,016	<b>Applicant(s)</b> NAKAMURA, KIMIO	
	<b>Examiner</b> Dismery E Mercedes	<b>Art Unit</b> 2651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 28 October 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-7 is/are rejected.
- 7) ☒ Claim(s) 4 and 8 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 October 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>10/28/2003</u> . | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.
2. The information disclosure statement (IDS) submitted on October 28, 2003 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.
3. Figures 10, 11 and 12 should be designated by a legend such as --Prior Art--, because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.
4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: for example "2" of FIG.3. Please revise all the submitted drawings and verify that all reference characters in the drawings are disclosed in the specification and vice versa. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if

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only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

5. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "14" of figures 3 and 4, has been used to designate both a magnetic head and a recording head. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-3 and 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al. (US 6,128,166) in view of Elliot et al. (US 6,493,161).

As to Claim 1, Tanaka et al. discloses a magnetic recording apparatus comprising: a magnetic head mounting single pole head having a main pole and an return pole (as depicted in FIG.5); a magnetic recording medium having a magnetic recording layer in which a magnetic pattern is recorded using the single pole head (col.10, lines 17-20); a motor for rotating the magnetic recording medium (col.10, lines 65-66).

Tanaka et al. fails to particularly disclose a recording driver for supplying a recording current to a magnetic head, wherein the current waveform of the recording current supplied from the recording driver to the single pole head includes a first pulse exceeding a current amplitude at which the magnetic recording medium can be recorded, and a second pulse of the opposite polarity to that of the first pulse, the second pulse exceeding the current amplitude at which the magnetic recording medium can be recorded, wherein the current value between the first and second pulses is smaller than the recordable current amplitude.

However, Elliot et al. discloses a recording driver for supplying a recording current to a magnetic head, wherein the current waveform of the recording current supplied from the recording driver to a magnetic head includes a first pulse exceeding a current amplitude at which the magnetic recording medium can be recorded, and a second pulse of the opposite polarity to that of the first pulse, the second pulse exceeding the current amplitude at which the magnetic recording medium can be recorded (as depicted in FIG. 4), wherein the current value between the first and second pulses is smaller than the recordable current amplitude (FIG. 4).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time of the invention to use a recording driver to drive the single pole head of Tanaka et al. as suggested by Elliot al., because it would provide the system as taught by Tanaka et al. with the enhanced

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capability of reduced time of head field reversal and reduced power consumption (col.3, lines 38-39 of Elliot et al.).

As to Claim 2, the combination further discloses the current value between the first and second pulses passes through 0 mA and becomes asymptotic to 0 mA (as depicted in FIG.4 of Elliot et al.).

As to Claim 3, the combination further discloses the current value between the first and second pulses passes through an intermediate value between a peak current value of the first pulse and a peak current value of a second pulse and becomes asymptotic to the intermediate value (as depicted in FIG.5 of Elliot et al.).

As to Claim 5-7, are drawn to the apparatus of claims 1-3, and are therefore, rejected for the similar reasons set forth in the rejection of claims 1-3, *supra*.

***Allowable Subject Matter***

8. Claims 4 and 8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Claims 4 and 8 are allowable over prior art of record since the cited references taken individually or in combination fails to particularly disclose or suggest the apparatus/method of claims 1 and 5, further in combination with *a relationship  $T > W > T-WB/V$  is satisfied, where  $W$  is the time in which the first and second pulses exceed the magnetic recording medium-recordable current amplitude,  $T$  is the time length of the recording pattern,  $v$  is a relative*

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*transport speed of the magnetic head in the track direction of the magnetic recording medium, and WB is a write bubble size.*

**Conclusion**

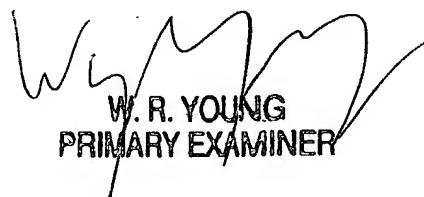
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dismery E Mercedes whose telephone number is 703-306-4082. The examiner can normally be reached on Monday - Friday, from 9:00am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on 703-305-4040. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dismery E Mercedes  
Examiner  
Art Unit 2651

DM

  
W. R. YOUNG  
PRIMARY EXAMINER